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GENERAL NOTES.

Astronomical Papers.—At the meeting of the Astronomical and Astrophysical Society of America, held at Put-in-Bay, Ohio, August 25-28, 1908, a programme consisting of thirty-one papers was presented. Titles of these papers, and abstracts from most of them, were printed in *Science* for December 11th. Titles and abstracts of twelve papers upon astronomical subjects presented before Section A of the American Association for the Advancement of Science, at the Baltimore meeting during convocation week, were printed in *Science* for January 22, 1909.

Notes from "Science."—The Paris Academy of Sciences has divided the La Lande prize between Professor W. L. ELKIN, director of the Yale Observatory, and Dr. F. L. CHASE, assistant astronomer in the observatory, for their papers on "The Parallax of 163 Stars." Mr. M. F. SMITH, assistant in the observatory, was given honorable mention in the award.

Professor GEORGE DAVIDSON, head of the geographical department of the University of California, has been presented with the Charles P. Daly medal of the American Geographical Society.

The Vienna Academy of Sciences has elected M. HENRI POINCARÉ, the eminent mathematician, to honorary membership. Among the corresponding members elected is Dr. G. H. DARWIN, Plumian professor of astronomy at Cambridge.

Dr. H. MORIZE has been appointed director of the Rio de Janeiro Observatory in the room of the late Professor L. CRULS.

M. CHARLES E. STUIVAERT, associate astronomer in the Royal Observatory of Belgium, died on November 18th, at the age of fifty-seven years.

The Royal Society has given to Cambridge University the stellar spectroscopic equipment which has been in the care of Sir WILLIAM HUGGINS since 1871. It consists of the following instruments: A refracting telescope with an object-glass fifteen inches in diameter and fifteen feet in focal length, to which is attached a spectroscope arranged for both visual and photographic work; and a Cassegrain reflecting telescope with a mirror made of speculum metal, eighteen inches in diameter and about seven feet in focal length, to which a spectroscope is attached with optical parts made of Iceland spar and quartz, for photographing the ultra-violet spectrum of stars. These two telescopes are mounted equatorially on a single polar axis, in such a way that they can be moved independently in declination. They are at present installed in a dome about twenty feet in diameter, in Sir WILLIAM HUGGINS's garden at Tulsehill. The telescopes and the equatorial mounting were made by Sir HOWARD GRUBB, in Dublin, and the spectroscopes by Messrs. TROUGHTON and SIMMS. The instruments are described as being in excellent working order, and would only require such insignificant changes as are usually needed in passing from one series of observations to another in the ordinary work of an observatory, but a suitable dome will have to be provided for the proper installation of the telescopes.

Lord ROSSE bequeathed £1,000 to Trinity College, Dublin, for the science schools. His telescope and scientific instruments are left to his oldest son, with £2,000 for their upkeep.

George W. Hough.[1]—By the death of Professor GEORGE W. HOUGH, on New Year's day of the present year, astronomy and meteorology lost a follower who has made contributions of permanent value to both sciences. Those who enjoyed the privilege of acquaintance with Professor HOUGH will agree that he well deserved the tribute paid to him by a distinguished astronomer, who, in a personal letter, says: "He was a rare man among astronomers in giving to astronomical work good sound common sense. He never found a mare's nest, and never went into idle speculations where the maximum conclusions are deduced from the minimum facts. For more than thirty years I have admired his honesty and good faith in all scientific work. So far as I know, there is nothing he ever had occasion to correct or retract, which is saying a good deal in these days."

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[1] This brief account of Professor HOUGH's life is taken in large part from a sketch to appear in the *Monthly Weather Review,* which was sent to me in advance of publication.—R. G. AITKEN.

George Washington Hough was born in Montgomery County, New York, on the 24th of October, 1836; graduated B. A. from Union College in 1856; married in 1870; and died at his home in Evanston, Ill., on the first day of the current year.

Upon leaving college, Professor Hough taught for a year or so in the schools of Dubuque, Iowa; and pursued graduate work in Harvard College; so that his serious astronomical work did not begin until 1859, when he accepted appointment as assistant astronomer in the Cincinnati Observatory, then justly celebrated on account of its powerful glass and its able director, General O. M. Mitchell. At the end of his first year in Cincinnati came promotion to the directorship of the Dudley Observatory, where he succeeded the late Dr. B. A. Gould.

His fourteen years of residence in Albany (1860-1874) constitute a period during which his inventive genius was at its best. It was here that his printing barometer was brought out in 1865. This instrument gives two graphical records of the barometric height, on different scales, and prints with a type-wheel the reading of the barometer, at the end of each hour, to the nearest thousandth of an inch. It was about this time, also, that his self-recording thermometer and anemograph were devised. In the *Annals of the Dudley Observatory*, Vol. II (Albany, 1871), may be found a description of these instruments, together with a continuous hourly record from the printing barograph for a period of five years. In 1871 he perfected his now well-known printing chronograph.

Examination of the reports of the Dudley Observatory during these years shows that Professor Hough, in addition to his interest in meteorology, gave full attention to the astronomical work of the observatory, carrying on meridian-circle observations of almanac stars, of planets and of asteroids, and also zone observations, and observations with the equatorial telescope. It is of interest to note that as early as 1867 he began to turn his attention to double stars, stating in his report for that year his intention of remeasuring the closer pairs from Struve's catalogue as opportunity offered.

An interval of five years, between 1874 and 1879, was devoted to commercial pursuits. The latter of these dates marks his appointment to the directorship of the Dearborn Observatory, a post which he was destined to honor for the succeeding thirty years. The year 1879 also marks the beginning of a micrometric study of the surface of the planet *Jupiter,* which within a few years made him a leading authority upon this subject. Except for the year 1888, when the Observatory was moved from Chicago to Evanston, his study of *Jupiter* was uninterrupted to the end of his life, and his papers giving the results of this work are commended to students of planetary markings.

Professor HOUGH's interest in double stars became more active when he secured the use of the fine 18½-inch Dearborn telescope, which already had an honorable record in work of this character. Beginning with the year 1881, he gave a portion of his time to the discovery of new double stars as well as to the measuring of pairs already known. So successful was he in this work that 648 new pairs stand to his credit. As many of these are exceedingly close and difficult, and a very large percentage of them sure to prove binary systems, they well merit the attention of astronomers. Quite recently Professor ERIC DOOLITTLE, of the Flower Observatory, has remeasured all the Hough stars, and published his results, together with the earlier ones by HOUGH and other observers, in a general catalogue,—a well-deserved compliment to the value of HOUGH's work. It may be added that one of his discoveries, Ho 212 = 13 *Ceti,* has been shown to revolve in a period of seven and one half years—a period shorter than that of any other known visual binary except δ *Equulei.*

On the removal of the Dearborn Observatory to Evanston in 1888, a new dome was to be designed. That fine mechanical sense which had already enabled him to do much for the instrumental side of his science now led him to invent a roller-bearing dome and a most excellent observing chair, which have been copied in many important observatories.

Class-room teaching Professor HOUGH never considered his chief function. Yet no student ever left his lecture with the recollection of an unkind word or of an explanation that was not clear.

Sham and ostentation were foreign to his nature. In simplicity of life, accuracy of scholarship, singleness of purpose, and kindliness of heart, his friends will all remember him as a worthy example.

The Total Solar Eclipse of May 8, 1910.—The following data were published by A. M. W. Downing, in *Monthly Notices of the Royal Astronomical Society,* No. 9, **68**, 664, 1908:—

This eclipse is observable in Tasmania, though not under very favorable conditions, owing to the Sun's low altitude at the time of totality.

The particulars for Hobart are given on page 444 of the *Nautical Almanac* for 1910. It will be noticed that the Sun sets before the ending of the partial phase of the eclipse.

Port Davey, in the southwest of Tasmania, is, however, a more favorable station from which to observe the total phase of this eclipse, the duration of totality there being half a minute longer than the duration at Hobart. Some particulars of the eclipse as seen from Port Davey are given, as an example of eclipse calculations, on page 590 of the *Nautical Almanac* for 1910. For the convenience of observers these are reproduced here, and some additional particulars added.

Port Davey. Long. 146° 0′ E. Lat. 43° 22′ S.
Standard Mean Time (10^h East).

						Angle from	
		d	h	m	s	North Point.	Vertex.
First contact	May	9	3	4	2	247°	99°
Total eclipse		9	4	11	55	52	272
		9	4	15	25	267	127
Sun sets		9	5	8			

With the existing errors of the lunar tables, the predicted times for the phases of the eclipse given above will be several seconds too late. It may be useful, therefore, to add the intervals in time from the instant when the cusps subtend a given angle at the Sun's center to the commencement of totality.

Angle of Cusps.	Time before commencement of totality.
90°	42^s
60	16
45	9
30	4
15	1

The Sun's altitude at the time of totality is 8°.

Note on the Life and Services of John Tebbutt.—An Australian correspondent has sent me a copy of the *Sydney Morning Herald* for October 17, 1908, containing an appreciative review of the life and astronomical work of Mr. John Tebbutt, of Windsor, New South Wales. As explained in the review, which is published below, Mr. Tebbutt is a private astronomer. His services have been continuous and exceedingly fruitful for several decades. In this connection it should not be forgotten that contributions from the southern hemisphere, where observers are scarce, have a value much greater than similar ones from the northern hemisphere, where active observatories exist in abundance. This is especially true of comet observations. For long stretches of time Mr. Tebbutt was really the only active and accurate observer of these objects in the southern hemisphere. His energy and enthusiasm are worthy of wide recognition from astronomers in all countries, and the writer expresses the hope that Mr. Tebbutt's activity has not ceased. W. W. C.

Mr. John Tebbutt has just issued a most interesting popular account of his astronomical work at Windsor from 1853 to the end of 1907. This is a remarkable instance of a lifelong devotion to science, and though Mr. Tebbutt has his reward in the knowledge of much fine work accomplished, and incidentally in his high reputation as an astronomer, too few of us realize the importance of the contributions to science New South Wales has thus been able to make. The sketch now issued may do something to remove an ignorance which is not altogether the fault of the man in the street, for astronomical papers are not as a rule published in a form accessible and intelligible to him. Mr. Tebbutt's grandfather arrived in Sydney about the close of 1801, traveling, since there was no other way, in the convict ship "Nile," on which was the celebrated Margaret Catchpole. The family shortly after their arrival settled in the Hawkesbury district, and carried on a general business at Windsor from 1829 to 1843. It was here that John Tebbutt was born in 1834. After a time the local Church of England clergyman undertook his education, and brought him up on sound classical fare, but without neglecting mathematics and the "use of globes." Mean time, the family had acquired the estate known as the Peninsula, and a house had been erected in 1845. Mr. Tebbutt was still a boy when he first felt the fascination of astronomy, and he tells us he made his first observation—that of a comet—in 1853, when he possessed only a marine telescope and a celestial atlas. The brother of Mr. Stiles, the clergyman, had been a midshipman in the Royal Navy, and he suggested the purchase of a sextant and a book on navigation. There was in the house a Scotch eight-day clock, with seconds pendulum, which is still going. In the early days Mr. Tebbutt regulated the clock by sextant observations, and also by transits of the Sun and stars over two fixed plumb-lines adjusted at a considerable distance from each other and in the plane of the meridian. He had read that the Sun rotated in about twenty-five days, and proceeded to verify this in an ingenious manner. This led him to make his first astronomical publication—in the *Sydney Morning Herald* of 1854. In 1857 there was a total eclipse of the Sun. It happened that Windsor was almost at the center of the Moon's dark shadow. In 1858 comet Donati appeared, and with the rough instruments at his disposal Mr. TEBBUTT calculated its orbit. Another comet appeared in 1860, and Mr. TEBBUTT's orbit for this, calculated from sextant observation, was confirmed by our first Government Astronomer, Rev. W. SCOTT, who had a small equatorial at Sydney. The year 1861 was notable, for then for the first time a new comet was discovered in Australia. Mr. TEBBUTT detected it on May 11th, but it did not become visible in the northern hemisphere until near the end of June. At the time it was first noticed TEBBUTT's comet was about 124,000,000 miles away, and as it showed no tail (moving in the line of sight) it was a difficult object. Subsequently it showed a tail, stretching a third of the way round the heavens, and it was one of the most brilliant comets Sir JOHN HERSCHEL had ever seen. Full justice was done, we are glad to know, to Mr. TEBBUTT's claims for priority in discovery. This comet has a period of some 409.4 years, so that it will not come back until about 2271. At this time Mr. TEBBUTT obtained an excellent refracting telescope. At the close of 1863 he erected a small observatory with his own hands—down to the bricklaying and slating. A two-inch transit instrument was added to the equipment. A small octagonal tower was built for the telescope. Meteorological observations had already begun. Mr. TEBBUTT decided to devote himself to occultations of stars by the Moon, to eclipses of *Jupiter's* satellites, and positions of comets. There were, of course, no cable messages in those days, and his work was therefore quite isolated. In 1867 a memorable flood occurred and the observatory was almost completely submerged though the instruments had been removed in time—the only flood which has entered the buildings up to the present time. In 1869 Windsor was placed in the list of observatories in the *British Nautical Almanac*—a well-deserved recognition. A larger telescope was added in 1872, and next year Mr. TEBBUTT was elected F. R. A. S. A great event was the observation of the transit of *Venus* in 1874—at a temperature of 109°.5 in the shade. A more substantial observatory was built in 1879, and a Grubb eight-inch equatorial added in 1886. An impetus was given to local astronomical work in 1895 by the establishment of a New South Wales branch of the British Astronomical Association, and of this Mr. TEBBUTT was first president. Mean time Mr. TEBBUTT's systematic work had been carried on through all these years with the utmost devotion, and to the great advantage of science; his material in fact early earned a reputation for remarkable accuracy, and was relied on by the most eminent of European calculators. This work drew to a close in 1904, when Mr. TEBBUTT had attained his seventieth year. It had included some 1,400 occultations of stars by the Moon, many valuable measurements of double stars, 120 papers in the

Monthly Notices, many other contributions to astronomical journals, and much work on cometary orbits—Mr. TEBBUTT has discovered several comets besides the notable one of 1861 referred to. Such single-souled labor is not easy to parallel, and it must be remembered that most of it was carried out without any assistance from others, and without that sympathy and intercourse which does so much to lighten the toil of scientific investigation.—W. G. P.